PACE atmosphere team measurement requirements

Version 17 April 2012: update of augmented band SNRs

Global coverage

As for ocean requirements (i.e., "OES Measurement Requirement_CRM_22Feb12"), except:

1. Solar zenith angle range of data collection, Threshold requirement: ≤ 81.5° (cosine of solar zenith angle ≥ 0.15) for continuity with L2 products from MODIS/VIIRS and imagery that provides cloud and meteorological context for nearby ocean retrievals having smaller solar zenith angle constraints. Goal: > 81.5°.

Spatial coverage

As for ocean requirements, except:

1. Sample size: Goal of 250m in selected channels (see table below)
2. Along track sample spacing: Goal of 250m in selected channels (see table below)

On-orbit Calibration

As for ocean requirements

OES channels and performance (same as 3-6-12 version but w/updated SNRs)

As for ocean requirements, with exception of following additional channels and/or modifications/clarification to baseline OES specs.

Augmentation to baseline OES (i.e., Threshold requirements from Section 3.2)								
CW (μm)	BW (FWHM, nm)	Rmax [a] (μ_0=1)	Lmax [a] (W/m^2-sr-μm)	Rtyp [a,b] (μ_0=1)	Ltyp [b] (W/m^2-sr-μm)	NEdR@ Rtyp	SNR@ Ltyp [a]	Spatial Resolution (m) [Threshold, Goal [c]]
0.940	15	0.80	210	0.03	7.8	0.0002	150	1000
1.378	10 [d]	0.80	95	0.03	3.5	0.0003	100	1000
2.250 [e]	50	0.90	21	0.03	0.7	0.0002	150	1000 250
		Additional info. and/or modification to baseline OES						
0.665								1000 250
0.865								1000 250
1.640								1000 250
2.135								1000 250
0.763	5nm; CW tolerance: ±2.5nm; BW/CWL knowledge : < 0.1 nm							1000 250

Table notes:

a. Generally consistent with MODIS 0.94 and 1.38 μm 1 km native resolution bands and VIIRS 2.25 μm channel at nadir native resolution. When referenced to above OES Ltyps, MODIS SNRs in the native 1 km 0.94 and 1.38 μm bands are 130 and 90, respectively. At above Ltyp, VIIRS 2.25 μm band SNR is ~60. For MODIS, Rsat ~15% larger than Rmax in these bands.
b. Rtyp corresponds to cirrus optical thickness of approximately 0.2–0.3.
c. Goal spatial resolution for reduction of low cloud heterogeneity biases.
d. Goal BW (MODIS 30 nm BW found to be too large for adequate cirrus detection; VIIRS 15 nm found to be significantly better).
e. For cloud phase and VIIRS/ABI cloud microphysics continuity.